

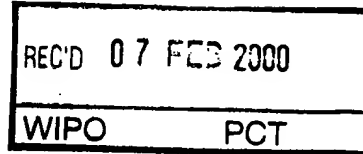


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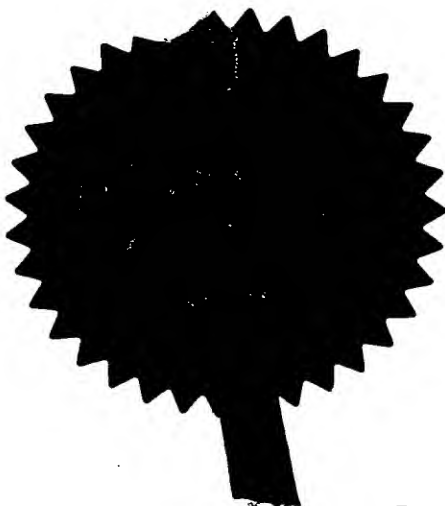
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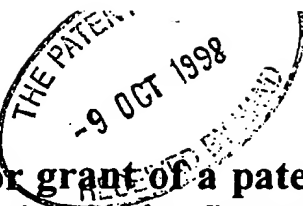
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Cardiff Road  
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1. Your reference HL57357/000/CIV

2. Patent application number  
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09 OCT 1998

9822100.5

3. Full name, address and postcode of the or of each applicant (underline all surnames)

TELEFONAKTIEBOLAGET L M ERICSSON  
126 25 STOCKHOLM  
SWEDEN

Patents ADP number (if you know it)  
If the applicant is a corporate body, give the country/state of its incorporation

SWEDEN

76373000J

4. Title of the invention  
TELECOMMUNICATIONS TERMINALS

5. Full name of your agent (if you have one)

Haseltine Lake & Co.

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Imperial House  
15-19 Kingsway  
London WC2B 6UD

Patents ADP number (if you know it)

34001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

✓ Priority application number  
(if you know it)

Date of filing  
(day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day/month/year)

8. Is a statement of inventorship and of right to a grant of patent required in support of this request? (Answer "Yes" if:  
a) any applicant named in part 3 is not an inventor, or  
b) there is an inventor who is not named as an applicant, or  
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YES

# Patents Form 1/77

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Description 5

Claim(s) 2

Abstract 1

Drawing(s) 1 + 1

10. If you are also filing any of the following, state how many against each item.

Priority documents 0

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Statement of inventorship and right to a grant of patent (Patents Form 7/77) 1

Request for preliminary examination and search (Patents Form 9/77) 1

Request for substantive examination (Patents Form 10/77) 0

Any other documents (please specify) 0

11. I/We request the grant of a patent on the basis of this application

Signature

*Haroldine Lohr & Co*

Date

7th October 1998

12. Name and daytime telephone number of person to contact in the United Kingdom

MR. C.I. VIGARS

[0117] 9260197

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# TELECOMMUNICATIONS TERMINALS

The present invention relates to telecommunications terminals. In particular, the invention relates to a structure for a telecommunications terminal which allows the same structure to be used for terminals having different functionalities.

## DESCRIPTION OF THE RELATED ART

A typical fixed radio telecommunications terminal may have a radio transceiver, a radio system interface, a user interface, including a keypad, a microphone and a loudspeaker, and connecting logic units.

One previously considered way of reducing cost in such devices has been to integrate as much functionality as possible into one semiconductor integrated circuit. Such devices can then be manufactured efficiently in large numbers.

However, such a technique is not well-suited to an environment in which customers demand a large variety of functionality. It then becomes difficult to design low-cost solutions that can provide all the required services and functions. For example there are problems combining different techniques such as GSM and DECT (Digital Enhanced Cordless telephony) in one unit. It may be necessary to provide a range of integrated circuits, which can, between them, provide the required range of functions, with the result that the time and cost associated with the design of each integrated circuit are used less efficiently.

## SUMMARY OF THE PRESENT INVENTION

The present invention seeks to provide a structure which can be used to offer telecommunications terminals having a range of functionality. More specifically, the invention provides a modular structure for a

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telecommunications device.

Embodiments of the invention may provide a telecommunications device having a bus, to which different modules may be connected as desired.

5 According to one specific embodiment of the present invention there is provided a telecommunications terminal comprising a communications bus, a radio module which is connected to the communications bus and which is operable to receive and  
10 transmit radio telecommunications signals and transmit radio telecommunications signals, and a plurality of connection modules which are connected to the communications bus in parallel to one another and to the radio module and which are operable to connect the  
15 terminal to respective telecommunications networks, the radio module also being operable to communicate with at least one of the connection modules via the communications bus.

#### BRIEF DESCRIPTION OF THE DRAWINGS

20 Figure 1 is a schematic diagram illustrating the structure of a telecommunications terminal in accordance with an embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE DRAWINGS

25 Figure 1 shows the architecture of a telecommunications terminal 2 embodying the present invention. The terminal 2 includes a communications bus 21, a radio module 22, a line connection module 23,  
and a control module 24. Also connected to the bus 21 is a man-machine interface 25. The radio module 22,  
30 the line module 23, and the control module 24 are connected in parallel to, and communicate with one another via, the communications bus 21.

The communications bus is a standard open communications bus. For example, the bus could be the

universal standard bus (USB) and can provide a highly flexible base for carrying both data and telephony information between the modules in the terminals.

5       The radio module 22 contains the air interface  
function for interfacing with the desired radio  
telecommunications network. Specifically, the radio  
module 22 has a connection to an antenna 221,  
transceiver circuits 222, associated control logic 223  
in the form of hardware and/or software, and an  
10       interface 224 to the communications bus. The radio  
system could for example relate to a digital enhanced  
cordless telephony system such as DECT, CT2, or CT3.  
Thus, the transceiver circuits 222, under the control  
of the logic circuits 223, converts signals received  
15       from the bus 21 into a form suitable for transmission  
over the air interface, and vice versa.

      The line module 23 includes the relevant  
functionality required to connect to fixed  
telecommunication systems, namely an interface circuit  
20       231, together with a bus interface device 232 and  
connecting logic 233 in hardware and/or software. The  
telecommunication system supported by the module could  
for example be an integrated services digital network.  
Thus, the interface circuit 231, under the control of  
25       the logic circuits 233, converts signals received from  
the bus 21 into a format suitable for transmission over  
the fixed network, and vice versa.

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      Overall control terminal of the terminal resides  
in the control module 24, which includes a bus  
30       interface 241 and a processor 242 with appropriate  
associated memory devices.

      The man-machine interface 25 also includes a bus  
interface 251, but is otherwise generally conventional,  
in that it includes a keypad 252 for receiving data

input by a user, a microphone 253 for receiving speech from a user, and a loudspeaker 254 for providing audio outputs to a user, all under the control of a control circuit 255.

5           Importantly, in accordance with the invention, the radio module 22, and line connection module 23 are removable and replaceable. Moreover, the bus has connections 26, 27, etc. for other radio modules and line connection modules providing different  
10           functionality.

          For example, other line connection modules might provide a connection to a plain old telephony system (POTS), or an ethernet connection to a LAN.

          Other radio modules might provide a connection to  
15           a personal handyphone system (PHS) a digital advanced mobile phone system (D-AMPS), a wide band CDMA system (W-CDMA) or the Qualcomm CDMA system (IS-95).

          In addition, other modules can easily be devised for connection to the connections 26, 27 of the  
20           terminal 2, such as an uplink module for cable TV, a CCTV surveillance system or other such devices.

          Thus an embodiment of the present invention splits the functionality of the terminal into stand alone modules which are interconnected by the standard bus.

25           In this way, the user is able to obtain a telecommunications terminal which provides the functionality which he requires. For example, if it is  
30           necessary for the user to be able to transmit signals received in a CCTV surveillance system, and to be able to transmit them either over a LAN and or over a GSM mobile telephone network, the terminal can be provided with the necessary modules to allow these options.

          The architecture of the present invention can provide a low cost hardware solution to the problem of

supplying devices with such a wide range of functionality because it can make use of high volume standard components which are able to be used with many different functional devices.

5           The structure of the present invention has several clear benefits over the prior art devices. Terminals in accordance with the invention can provide clear interfaces between different services and functions, which can allow short lead times when developing new  
10 functionality, and can support parallel development projects, because it is only necessary to consider the new functionality in isolation, rather than having to consider its impact on other features of the device, as would be necessary in an integrated device. In  
15 addition, such a terminal can reuse old functionality and integrate many different systems into a single terminal. Moreover, the user can add new modules and features as required, making it easy to expand the functionality of such a system.

20           There is thus provided a telecommunications terminal having a structure which allows the manufacturer to provide a range of products having features chosen by the user, while allowing the user to update the terminal when required.



CLAIMS

1. A telecommunications terminal comprising a communications bus, a radio module which is connected to the communications bus and which is operable to receive and to transmit radio telephone communications signals, and at least one connection module which is connected to the communications bus in parallel to the radio module and which is operable to connect the terminal to a fixed telecommunications network, the radio module also being operable to communicate with the connection module via the communications bus.

2. A terminal as claimed in claim 1, comprising a plurality of such radio modules which are operable to communicate with respective radio telecommunications networks, and which are connected into the communications bus in parallel to one other and to the connection module.

3. A terminal as claimed in claim 1 or 2, comprising a plurality of such connection modules which are operable to communicate with respective fixed telecommunications networks, and which are connected into the communications bus in parallel to one other and to the connection module.

4. A radio communications terminal, comprising:  
an open standard bus;  
a radio modem, including:  
air interface functionality;  
logic; and  
an interface to the open standard bus; and  
at least one stand-alone module, providing a communications function, and having an interface to the open standard bus.

5. A terminal as claimed in claim 4, comprising means for connection of at least one additional stand-

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alone module to the open standard bus.

6. A terminal as claimed in claim 4 or 5,  
wherein the open standard bus is a Universal Serial  
Bus.

ABSTRACT

TELECOMMUNICATIONS TERMINALS

5 A structure is disclosed for a telecommunications terminal. The terminal includes an open bus and stand-alone modules which provide the required communications functionality. For example, modules might be provided for connection to an ISDN network, and for connection to a radio communications network such as a DECT system.

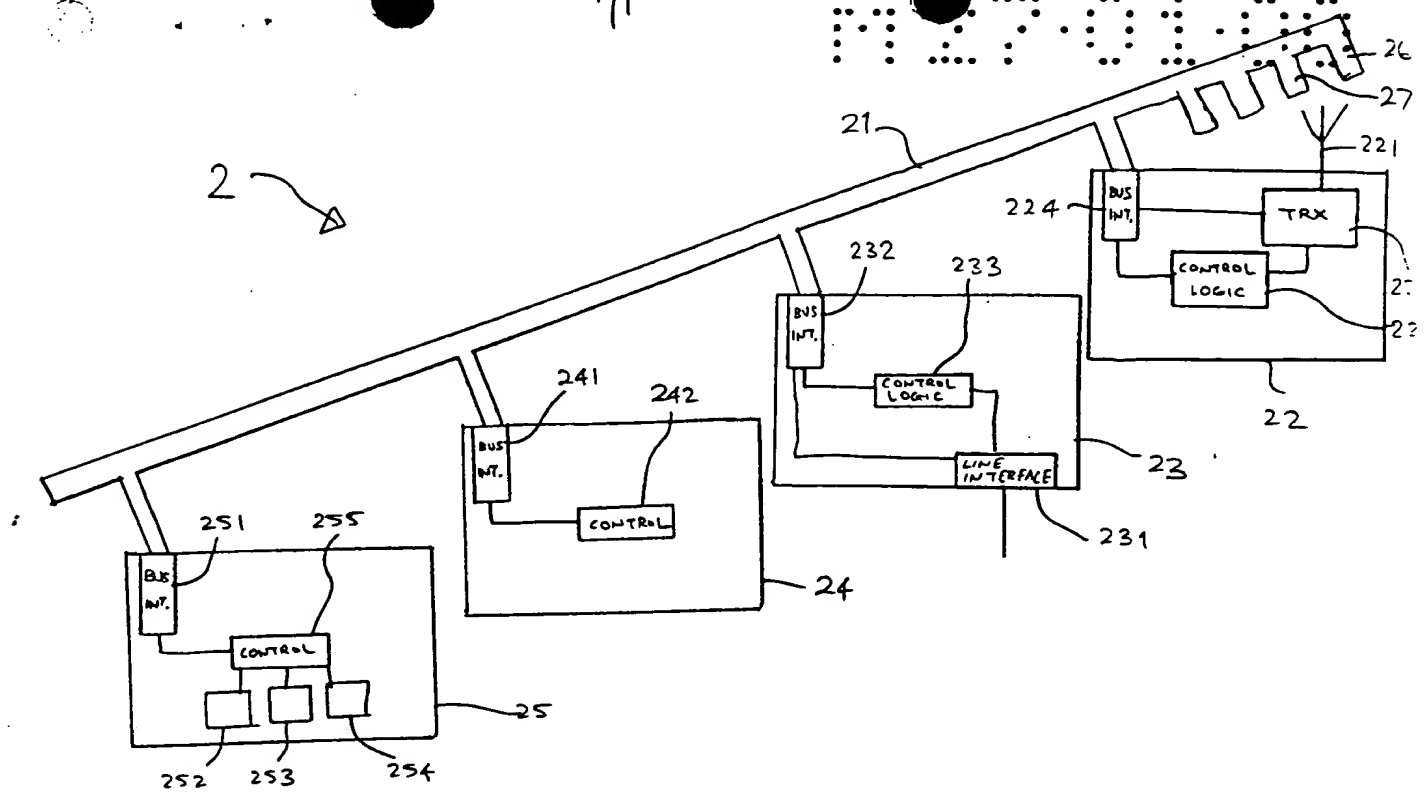


FIGURE 1